



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

probably from Mauritius. Its principal distinctive features are the very small tympanic cavity and the backward prolongation of the palatines and vomers, the latter forming a suture with the basisphenoid. (Proceeds. Lond. Zool. Soc., Jan., 1891.)—Two species of Procoptodon are described and figured by Mr. Lydekker in the Quarterly Journal of the Geological Society, Nov., 1891. These fossils are two mandibular rami, and they were obtained from the claybeds near Miall Creek, on the Northern frontier of New South Wales. They have been referred provisionally to *P. rapha* and *P. goliah*.

---

### MINERALOGY AND PETROGRAPHY.<sup>1</sup>

**Petrographical News.**—The eruptive rocks of Velay, Haute Loire, France, in the order of their age are basalts, trachytes and trachytic phonolites, augite andesites, porphyritic basalts, nepheline phonolites and nepheline basalts. Termier,<sup>2</sup> who describes them, gives but a few brief notes on each type. The younger phonolites form the larger part of the hill. They contain aegerine in light-green porphyritic crystals, and in microlites. At the south-east of St. Pierre-Eynac are tertiary clay slates cut by dykes of phonolite, whose tiny veins penetrate metamorphosed phases of the clastics, and are thus consequently regarded as the agents producing the alteration. The rocks representing the first stage in the alteration consist of granitic debris, in which secondary opal has been deposited around the feldspar and quartz fragments. In some instances, in addition to the opal there have been formed also secondary quartz and calcite, the former as a fibrous rim around the grains. In more intensely changed phases, the slate is traversed by veins of phonolite, whose contact with the sedimentary rock is not visible, since on both sides of it the material of the phonolite has thoroughly impregnated the slate. On the other hand the phonolite of the veins contains sphene, but no augite, while the normal rock contains an abundance of aegerine, but no sphene. In the final stage all the quartz of the slate has disappeared, and the rock is comprised principally of opal, serpentine and clay (halloysite?), with pleonaste, colorless augite and hornblende as new products. The alteration is thus a silicification. In other, more rare cases, it is a feldspathization.—Hutchings<sup>3</sup> has recently studied the material of which slates are formed, having examined for this purpose, clays and micaceous sand-

<sup>1</sup> Edited by Dr. W. S. Bayley, Colby University, Waterville, Me.

<sup>2</sup> Bull. d. Serv. d. l. carte Geol. d. Fr. No. 13, 1890.

<sup>3</sup> Geological Magazine VII, 1890, p. 264 and 316, and Ib. 1891, p. 164.

stones from near Seaton, England, north of Newcastle-on-Tyne. The harder shale layers are composed mainly of mica, quartz, feldspar, zircon and other accessory minerals, as garnet, rutile, anatase, tourmaline, sphene and barite. The biotite is the first of these to undergo change under the influence of weathering processes. In the case studied it has not changed to chlorite, but has become bleached and has yielded epidote. The quartz and feldspar are uniformly distributed throughout the mass, while the mica usually lies out its flat surfaces in the bedding planes. In addition to the mineral grains already mentioned there is present a sort of groundmass or paste, made up of indistinctly granular matter, with microlites of various kinds and a large amount of a fine micaceous substance, besides large plates of a secondary mica. In a fine grained portion of the deposit, the paste is quite abundant and in it are numbers of minute rutile needles, flakes of ilmenite, some small perfect crystals of tourmaline and a considerable quantity of the secondary mica (muscovite), which differs from the clastic mica in that the edges of the grains extend out between the surrounding minerals, and the plates are full of minute rutile needles. In the very finest grained, smoothest clay bands of the region, the paste forms the largest part of the mass, while the well marked clastic grains are few in number, the biotite having disappeared entirely. Kaolin was not certainly recognized in even the thinnest sections of fire-clay, the fine grained granular substance of which this clay principally consists, being mainly the paste described above. The abundance of rutile, that is so noticeable a feature of the clays examined, is supposed to have originated upon the decomposition of the biotites, and the muscovite (or sericite), by the alteration of the paste. This mineral gradually increases in quantity, and then under the influence of pressure is so orientated that a micaceous slate results. The absence of biotite from most slates is thought to be due to the easy decomposability of the substance; and its presence in the sediments from which some slates were formed is thought to be indicated by the large percentage of rutile and epidote in the latter. In his second contribution to the subject the author describes the results of a separation of the components of a fine clay by fractional levigation, and an examination of the separated portions. He concludes from his study that nearly all the muscovite of slates, and all of the rutile bearing variety, is a secondary product, subsequent in origin to the deposition of the material from which the slates were formed.—The iron ores of Sao Paulo, Brazil, are found in two principal districts, the Jacupiranga and the Ipamena. In the first locality the ore, with a violet titaniferous pyroxene, forms a schistose rock, in which perovskite, apatite and a

zeolitized silicate are accessory constituents. As the amount of the ore increases, that of the other constituents decreases, until in some cases an almost pure magnetite results. By weathering the augite gives rise to mica in abundance. In some cases the pyroxene rock is found associated with layers in which magnetite and nepheline are the principal components. This Derby<sup>1</sup> believes to be genetically connected with the ore-bearing rocks, which he calls jacupirangite, and regards as eruptive. Much of the ore of the Ipanema district originally occurred with acmite and apatite as segregations in an acmite syenite, which is now highly decomposed, so that the segregations are scattered like boulders over the ground. Fouque<sup>2</sup> has redetermined the minerals of the Santorin rocks and has discovered that his former determinations of some of them were erroneous. In the pumice of Acrotiri, Isle of Thera, composed of glass fibres with opal material between, are little transparent crystals whose nature has heretofore been in doubt. A new examination proves them to be alunite. A quantity—separated and analyzed—gave:  $\text{SO}_3=38\%$ ,  $\text{Al}_2\text{O}_3=37.3\%$ ;  $\text{H}_2\text{O}=13.3$ ; alkalis= $11.4\%$ . The blocks enclosed in the lava of 1866, formerly supposed to consist of wollastonite, *fassiate* and melanite, are now known to contain in addition to these substances anhydrite. The interiors of the nodules are composed almost exclusively of anhydrite, with a little augite and other constituents of the enclosing rock, in which are wollastonite and melanite.—Four small boulders of nephrite from British Columbia have been examined by Harrington.<sup>3</sup> Three were found near Lytton on the Fraser River, and the fourth in the upper part of the Lewes River, near the Alaskan boundary line. The composition of each is as follows:

	$\text{SiO}_2$	$\text{AlO}_2$	$\text{FeO}$	$\text{MnO}$	$\text{CaO}$	$\text{MgO}$	Loss	Sp. Gr.
1.	55.32	2.42	5.35	.52	14.00	20.16	2.16	3.0278
2.	56.98	.18	4.59	.17	12.99	22.38	2.64	3.003
3.	56.54	.40	3.61	.16	13.64	22.77	2.92	3.01
4.	56.96	.51	3.81	.53	13.29	22.41	2.91	3.007

No. 3 contains pale hornblende crystals extinguishing at  $8^\circ\text{--}18^\circ$ .

—Derby<sup>4</sup> has discovered that xenotime is an almost universal constituent of muscovite granites, and presumably of other acid potash rocks. Residues obtained by washing the powder of such rocks in a gold washer's pan nearly always yields xenotime and monazite. Eighty-six and two-thirds percentage of the undoubted muscovite granites from

<sup>1</sup> Amer. Jour. Sci., Apr. 1891, p. 311.

<sup>2</sup> Bull. Soc. Franc. d Min., 1890, XIII, p. 245.

<sup>3</sup> Trans. Roy. Soc. Can. 1890, p. 61.

<sup>4</sup> Amer. Jour. Sci., Apr., 1891, p. 308.

Brazil, examined by Derby, disclosed the presence of this accessory, which is thought by him to be as constant a constituent of these rocks as any mineral save zircon. Experiments made with granites from the United States seem to indicate the value of the pan as a petrographical instrument in the study of the rare and heavy components of rocks. —The rare blue hornblende riebeckite is reported by Cole<sup>1</sup> in three pebbles found in the drift of North England and of Wales, in addition to its occurrences in the microgranite of Mynydd Mawr, where it was discovered by Harker and Bonney a few years ago.

**Mineralogical News.—General.**—Since many of the supposed paramorphs have been proven within recent years to be due not to the molecular rearrangement of material already existing, but rather to the solution of some original substance and its replacement by a new deposition, Bauer<sup>2</sup> has re-examined the pseudomorphs of *rutile* after *brookite* from Magnet Cove, Ark., to determine whether or not the substance is a true paramorph. After studying many thin sections of the brookite, rutile, and intergrowths of the two, he concludes that the latter are true paramorphs, the rutile originating in a molecular re-arrangement of the  $\text{TiO}_2$ . The rutile begins to form on the exterior of the brookite crystals, or along cracks in them, as needles penetrating the brookite substance. The rutile pseudomorphs after anatase from Brazil, the Urals and other<sup>3</sup> localities, are also declared to be true paramorphs. The same author has also re-examined the *Michel-levyite* of Lacroix, which Dana declared to be barite, and finds that Dana's statement is correct. The axial angle is large, but it cannot be measured, as the acute bisectrix does not enter the field of view. The mineral differs from ordinary barite only in the possession of a very perfect cleavage in the direction of one prismatic face. On the base it shows twinning striations resembling those of plagioclase. The twinning plane is the prismatic face parallel to which is the most perfect cleavage. The structural peculiarities of the Perkin's Mill barite are all due to this abnormal cleavage, which in turn is dependent upon the twinning, which is new to the mineral, and is probably the result of pressure. Measurements of druse crystals of the same substance yield the forms characteristic of barite and the new plane  $\frac{1}{2} P\infty$  with  $a:b:c=.8152:1:1.3136$ .—The mineral associated with calcite and phillipsite as druses on the leucite,

<sup>1</sup>Miner. Magazine, IX, 1891, p. 222.

<sup>2</sup>Neues. Jahrb. f. Min., etc., 1891, I, p. 217.

<sup>3</sup>Ib. p. 250.

tephrite of Eulenberg in Bohemia, pronounced by Zepharovich<sup>1</sup> to be orthoclase, has been carefully investigated by Gränzer,<sup>2</sup> who thinks it more likely to be a *zeolite*. Its crystalization is probably triclinic, though by the parallel growth of many individuals there is built up a form closely resembling that of orthoclase.—The minerals characterizing the hollow spherulites of the rhyolite of Glade Creek,<sup>3</sup> Wyoming, and of Obsidian Cliff, in the Yellowstone National Park, like those found in other lithophysæ, are thought to be the results of aqueo-igneous fusion upon the material of the acid lava. The most abundant mineral thus formed is *quartz*, whose crystals are either attached to the walls of the cavities, thus exposing only one termination, or are interlaced forming a network built up of crystals occasionally doubly-terminated. Both the rare  $+\frac{3}{2}R$  and  $-\frac{3}{2}R$  are well developed, and also the equally rare forms  $\pm\frac{3}{2}P\frac{3}{2}$ . The next most noticeable mineral is *fayalite*, whose habit has already<sup>4</sup> been described. In some of the more irregular cavities at Glade Creek are accumulations of very small *sanidine* crystals, *hornblende* and *biotite*, of which the latter is never found associated with fayalite.—The *rhodizite* from the Urals, which has been declared to be regular with  $\infty O$  and  $O_2$ , is pyroelectric. The examination of it, extinction and its interference colors shows it to be pseudosymmetrical it being in reality monoclinic<sup>5</sup> with  $a:b:c::.707:1:1$ .  $\beta=90^\circ$ . The dodecahedron becomes  $OP, -P, +P$  and  $\infty P\infty$  and the tetrahedron  $\pm O_2, P\infty$  and  $\infty P2$ . An interesting series of experiments made by the same mineralogist on *jeremejewite* lately described by Websky<sup>6</sup> shows it to consist of an interior hexagonal kernel, surrounded by two zones with some orthorhombic properties, and an external one, with the characteristics of the kernel. The density of the material in each zone is the same, and its reaction under pressure and temperature is similarly slight. The kernel and the peripheral zones are uniaxial and negative, while the other two zones are biaxial, the inner one possessing the larger optical angle. The explanation of the phenomena offered by the author is to the effect that in the first stage of the mineral's growth it separated as an orthorhombic substance on the walls of the cavity. Upon this were deposited zones two and three, after which the cavity was filled by what is now the kernel. The optical anomalies of *phacolite*

<sup>1</sup>Sit. d. Kais. Ak. d. Wiss., 1885, X, p. 601.

<sup>2</sup>Min. u. Petrog. Mitth. XI, 1890, p. 277.

<sup>3</sup>Iddings & Penfield: Amer. Jour. Sci., July 1891, p. 39.

<sup>4</sup>Ib. XXX, July 1885, p. 59, and Ib. p. 271.

<sup>5</sup>Klein. Neues. Jahrb. f. Min., etc., 1891, I: p. 77.

<sup>6</sup>Ib. 1884, I, p. 1.

and *chabazite* are ascribed to the same causes as those assigned to the anomalies of analcite.—Some doubt having been cast upon the correctness of Baumhauer's conclusion that *nepheline* is trapezohedrally hemihedral, the mineral from three bombs of Vesuvius has again been examined. The figures produced on the  $\infty$  P faces of crystals, upon etching with HCl and HF, are unsymmetrical; consequently their crystallization is either pyramidal or trapezohedral hemihedral, and the forms are hemimorphic with respect to the vertical axis.<sup>1</sup>—Saltman<sup>2</sup> records the following as the composition of a *melanite* from Oberrothwell in the Kaiserstuhl:

SiO <sub>2</sub>	TiO <sub>2</sub>	ZrO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	Mn <sub>2</sub> O <sub>3</sub>	FeO	CaO	MgO	Na <sub>2</sub> O	K <sub>2</sub> O	Loss
30.48	11.01	1.28	3.13	15.21	.28	3.84	30.19	2.28	1.65	.19	

It is interesting for the large percentage of titanium shown by it, and for the considerable quantity of zirconium, which has heretofore never been found in any member of the garnet group.—After examining critically more than fifty analyses of *vesuvianite*, Kenngott<sup>3</sup> concludes that the composition of the mineral must be represented by a formula of two parts, like that of apatite. The silicate portion may be represented by  $4(2\text{RO} \cdot \text{SiO}_2) + 2\text{R}_2\text{O}_3, 3\text{SiO}_2$  [ $=4\text{R}''_2\text{SiO}_4 + \text{R}'''_4(\text{SiO}_4)_3$ ]. The composition of the non silicated portion is not yet known, but it probably contains the hydroxide group, sodium, potassium, and sometimes fluorine, in varying proportions.—*Almogen*<sup>4</sup> crystals from the Pic-de-Teyde, Teneriff are tabular in habit. They are negative and crystallize monoclinically with  $a : c = 1 : .825$ .  $\beta = 97^\circ 34'$ .—Rose colored dodecahedral garnets from Xalostic, Mex., have been analyzed by De Landero.<sup>5</sup> Their density is 3.516 and hardness 7.5. Their composition corresponding to  $(\text{Ca Mg})_3 \text{Al Fe}_2 (\text{SiO}_4)_3$ , is:

SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	CaO	MgO	MnOBaO	Res.
40.64	21.48	1.57	35.38	.75	tr.	.17

—Some good sections of *pericline* from the Pfischthal, Tyrole, have been very carefully studied by Münzig.<sup>6</sup> Their optical properties indicate that the substance is not a pure albite, but that it is an intergrowth of oligoclase (ab-an) with albite. The former comprehends the larger part of the pericline crystals, the latter appearing in it as small irregular flecks. Both feldspars are twinned according to the pericline law, with the albite apparently occupying pores in the oligoclase.—Des

<sup>1</sup>Baumhauer: Zeits. f. Kryst. XVIII, p. 611.

<sup>2</sup>Ib. p. 628.

<sup>3</sup>Neues. Jahrb. f. Min., etc., 1891, I, p. 200.

<sup>4</sup>Becke: Min. u. Petrog. Mitth., XII, p. 45.

<sup>5</sup>Amer. Jour. Sci., 141, 1891, p. 321.

<sup>6</sup>Neues. Jahrb. f. Min., etc., 1891, II, p. 1.

Cloizeaux<sup>1</sup> notes the similarity in habit between *chalcopyrite* crystals from Cuba and those of the French Creek Mines in Chester Co.,<sup>2</sup> Pa. A comparison of recent analyses of *violan* and *anthochroite* leads Igelström<sup>3</sup> to the conclusion that the two are identical.—In a recent brochure of the American Geological Society, Kunz<sup>4</sup> announces the discovery of small *diamonds* in the alluvial sands of Plum Creek, Pearce, Co., Wis., and the occurrence of fire opal in a vesicular basalt at Whelan, Washington.—Sandberger<sup>5</sup> has found pseudomorphs of markasite after pyrrargyrite at Chanarcillo, Chile.

**Miscellaneous.—Syntheses.**—Lorenz<sup>6</sup> has produced crystallized zinc sulphide by the sublimation of the amorphous salt in an atmosphere of ammonium chloride. The action is explained as taking place in two stages—first, the formation of zinc chloride and its sublimation, and secondly, the action of sulphuretted hydrogen upon this salt. By the action of dry  $H_2S$  on the respective metals crystalized *troilite*, *millerite*, *wurtzite* and *greenockite* were formed. The first is in little opaque tabular crystals, that are at first silver white and afterwards bronzy-yellow in color. According to Prof. Groth, they are probably hemimorphic. In addition to the greenockite there were produced in the same operation other crystals that are seemingly cadmium sulphide.—Though the synthetic production of augite is not a difficult problem, that of hornblende has heretofore resisted the best efforts of mineralogists to effect it. Chrustschoff<sup>7</sup> has however lately succeeded in obtaining the mineral by heating in a glass tube, from which the air had been extracted, a mixture of dialysed colloidal silicic acid containing 3% of  $SiO_2$ , and dialysed solutions of  $Al_2O_3$ ,  $Fe(OH)_3$  and  $Fe(OH)_2$ , with lime water, freshly prepared  $Mg(OH)_2$  suspended in water, and a few drops of sodium and potassium hydroxides. Upon heating these together for about three months at  $550^\circ$  the mixture became of a dirty-brownish-green color, when it was found to contain tiny hard grains of hornblende, analcite quartz, feldspar and diopside. The hornblende crystals were bounded by  $\infty P\infty$ ,  $P\infty$  and  $\infty P$ . Their extinction  $c \wedge C=17^\circ 50'$ . Their

<sup>1</sup>Bull. Soc. Franc. d. Min., XIII, p. 335.

<sup>2</sup>Cf. American Naturalist, 1889, p. 528.

<sup>3</sup>Neues. Jahrb. f. Min., etc., 1890, II, p. 271.

<sup>4</sup>Bull. Geol. Soc. Amer., Vol. 2, p. 638.

<sup>5</sup>Neues. Jahrb. f. Min., etc., 1891, I, p. 199.

<sup>6</sup>Ber. d. Deutsch. Chem. Ges. No. 9, 1891, p. 1501.

<sup>7</sup>Neues. Jahrb. f. Min., etc., 1891, II, p. 86.



double refraction was negative and pleochroism strong.  $2V=82^\circ$ , and composition :

SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	FeO	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	Loss
42.35	8.11	7.91	10.11	14.33	13.21	2.18	1.87	.91

—Otto and Kloos<sup>1</sup> find perfect crystals of periclase on a muffle in which magnesium oxychloride has been heated.

**General.**—The solubility of quite a number of minerals in pure water and in dilute salts has been carefully investigated by Doelter.<sup>2</sup> The sulphides, sulpho-salts, oxides and silicates examined are slightly soluble in water, with the addition of sodium sulphide the solubility of the first two groups is increased while that of the oxides is increased by sodium fluoride. The carbonate of sodium appears to produce but little effect upon these. The silicates are more readily soluble in carbonated water and in dilute solutions of sodium carbonate. Distilled water seems to act simply as a solvent upon all classes, whereas the other reagents produce more or less decomposition. Gold is dissolved to some extent in both the silicate and the carbonate of sodium at high temperatures. —Two instruments for the observation of the optical properties of minerals at high temperatures are described by Klein,<sup>3</sup> and a third by Fuess.<sup>4</sup> One is adapted for use on the microscope, where temperatures not greater than  $450^\circ$  are required. The second allows of observations at a bright red heat, the source of heat being electrical. The third is for use with gas.—Miers<sup>5</sup> gives a description of a simple and cheap, though quite accurate goniometer for student's use. Rinne<sup>6</sup> outlines an easy method of determining the character of the double refraction in uniaxial and biaxial crystals in converged light, based on the use of the gypsum plate. Practically the determination depends largely upon the colors of different segments of the microscopic field. It is especially valuable in determining the sign of weakly doubly refracting substances.—The fifth part of Hintz's *Handbuch der Mineralogie*<sup>7</sup> concludes the treatment of the mica group, and deals in the usual thorough manner with the chlorite and serpentine groups.

<sup>1</sup>Ber. d. Deutsch. Chem. Gesell, 1891, p. 1488.

<sup>2</sup>Min. u. Petrog. Mitth. XI, 1890, p. 319.

<sup>3</sup>Neues. Jahrb. f. Min., etc., 1890, I, p. 65.

<sup>4</sup>Ib. B. B., VII, p. 406.

<sup>5</sup>Min. Magazine, IX, 43, p. 214.

<sup>6</sup>Neues. Jahrb. f. Min., etc., 1891, I, p. 21.

<sup>7</sup>Leipzig 1891, p. 641-800.